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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARYBEFORE THE  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON D. C. 20554

In the Matter of

Amendment of Parts 15 and 90  
of the Commission's Rules to  
Provide Additional Frequencies  
for Cordless Telephones)  
)  
)  
) ET Docket No. 93-235  
) RM-8094  
)

To: The Commission

## COMMENTS

1. The Telecommunications Industry Association (TIA) Mobile & Personal Communications Consumer Radio Section ("the Section")<sup>1</sup> hereby offers its Comments on the Notice of Proposed Rule Making ("NPRM")<sup>2</sup> adopted by the Commission in the above-captioned matter. In that Notice, the Commission proposes to make available to cordless telephones 15 new frequency pairs near 44 and 49 MHz, to be shared on a secondary basis with the existing Private Land Mobile Radio Service (PLMRS) users.

2. This proceeding was initiated by a Petition for Rule Making filed by the Section on August 20, 1992, and the Section is fully supportive of the proposal put forth in the NPRM. The Commission has invited comments on a number of specific points, which we address herein.

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1. Formerly the TIA Personal Communications Section. The TIA's Mobile & Personal Communications Division (formerly the Mobile Communications Division) and its Sections were recently renamed to reflect the ongoing evolution of the wireless communications industry.
  2. FCC 93-422, Adopted August 20, 1993, Released September 17, 1993.

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### **SUITABILITY OF THE PROPOSED FREQUENCIES VS. OTHER POSSIBLE FREQUENCIES**

3. The Commission invites comments on the proposed frequencies and the suitability of potential alternative frequencies.<sup>3</sup> As noted in the NPRM, there are cordless telephones on the market that use the 915 MHz ISM (Industrial, Scientific, and Medical) band, and one model that operates in the 2450 MHz ISM band. These products operate under §15.247 and §15.249 of the Commission's Rules, and have only recently entered the market. As also noted in the NPRM, these products represent the high end of the market, due to the higher costs associated with UHF radio designs.<sup>4</sup> To compensate for their higher prices, they offer higher transmit power and better propagation characteristics in some environments (such as inside office buildings) compared to the existing 49 MHz units, due to their shorter wavelengths. The industry thus expects there to be a market for these products that is substantial, but distinct from that for the 49 MHz products, which offer residential consumers a low-cost, low-power wireless solution for the home. Although the prices of the UHF products will drop as the markets grow and cost-reduced designs are developed, those products will not be cost-competitive with the 49 MHz units for the foreseeable future. The Section therefore agrees with the Commission's implication that the spectrum available in the other bands is not a substitute for additional channels near 49 MHz.

4. The advantage of the specific frequencies proposed in the NPRM is their proximity to the 46/49 MHz frequencies used in the existing units. While intuition would suggest that the fundamental design and component costs for other, relatively nearby frequencies (e.g., 35 MHz or 65 MHz) should not differ greatly from those for 49 MHz, there are two factors that argue for having the additional frequencies as close as possible to the existing ones. First, close proximity of the frequencies facilitates the manufacture of units that can use all 25 channels.<sup>5</sup> Coupled with the automatic

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3. NPRM at par. 10.

4. In addition, spread spectrum technology (either direct sequence modulation or frequency hopping) must be used in products operating under the provisions of §15.247, which allows up to 1 watt of RF transmit power. The use of spread spectrum techniques requires a higher level of complexity in the product, leading to higher cost.

5. Close proximity allows the same tuned RF components (e.g., antennas, diplexers, front-end filters) to be used for both the existing and the new channels, and facilitates practical synthesizer designs.

channel selection mechanism proposed for the new Rules, this maximizes the likelihood that the customer will be able to have a clear channel on demand. Second, components and circuits for 44/49 MHz units can be modified versions of those already available for 46/49 MHz units, allowing manufacturers to take advantage of the scale economies of well-developed and cost-reduced design platforms. The consumer is the ultimate beneficiary of both factors.

5. The Section therefore continues to believe that the proposed frequencies are a good choice, given their proximity to the existing frequencies and their light loading of primary users, and given that the objective is to make available more capacity for low-cost cordless telephones.

#### AUTOMATIC CHANNEL SELECTION REQUIREMENT

6. The Commission has proposed to adopt the requirement suggested by the Section,<sup>6</sup> that cordless telephones using the new frequencies must "incorporate an automatic channel selection mechanism which will prevent establishment of a link on an occupied frequency." The NPRM invites comments regarding (1) whether a more specific requirement is needed, (2) the cost of implementing the requirement, and (3) whether specific information demonstrating compliance with this requirement should be filed with the equipment authorization application.

7. We continue to believe that the wording proposed in the NPRM offers the appropriate balance between effectiveness and practicality. While unambiguously requiring manufacturers to incorporate automatic channel selection into their designs, it allows the necessary latitude for design flexibility and innovation. Any well-designed automatic channel selection mechanism, coupled with the low power radiated by cordless telephones and the relative high power radiated by PLMRS units (which operate in the simplex, or push-to-talk mode), virtually guarantees that cordless telephones equipped with such a mechanism will not interfere with the PLMRS.<sup>7</sup> A

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6. The actual wording for the requirement proposed in the NPRM (par. 13) is that suggested by the Section in its Reply Comments, rather than its Petition. Based on Comments filed on its Petition, the Section agreed that the wording originally proposed in the Petition could be misinterpreted, and suggested the modified wording.

7. Due to the small amount of power radiated from cordless telephones, the end-of-range is only about 1000 feet even under the best of conditions, and more typically several hundred feet. A PLMRS mobile unit therefore would need to be within several hundred feet of a cordless transmitter even to receive a detectable signal in the absence of the desired signal from its own

PLMRS transceiver near enough to a cordless telephone to sustain interference from it, with its roughly 25 microwatts of radiated power,<sup>8</sup> would generate an overwhelming amount of interference into the cordless telephone upon transmitting, thereby causing the cordless telephone to register that channel as "busy." We therefore believe that (1) a more specific requirement is unnecessary, and (2) that the general requirement can be met in an effective way at reasonable cost. In addition, we believe that (3) a manufacturer should include, with its application for equipment authorization, a description of its automatic channel selection mechanism.

#### FREQUENCY PAIRING AND POTENTIAL TV INTERFERENCE

8. The NPRM proposes, as suggested by the Section's Petition, that there be no assigned pairing of the new frequencies. The NPRM further proposes to designate the frequencies near 44 MHz for the base unit, to minimize the impact on TV reception. The Section supports both proposals.

9. The NPRM also invites comments regarding the potential for interference to the IF (intermediate frequency) circuits of TV receivers. Through several of its members, the Section has had contact with the EIA R4 Engineering Committee,<sup>9</sup> which also was concerned about this potential problem. It was concluded that the interference potential was minimal, but it was agreed that the cordless telephone owner's manual should include instructions to separate the cordless telephone base unit from the television set if interference is observed.

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base. At such close proximity to the cordless receiver, the signal from the PLMRS mobile unit (typically several tens of watts, at least), once it begins transmitting, will easily be recognized by the cordless telephone as interference.

8. NPRM at footnote 9.

9. The Electronic Industries Association's Consumer Electronics Group (EIA/CEG) includes among its members manufacturers of television receivers, and therefore has a strong interest in avoiding an interference problem. One of the functions of the EIA R4 Engineering Committee is to study such issues, and when necessary, take steps to resolve them. Some of the Section's member companies manufacture TV sets as well as cordless telephones, and also are members of EIA/CEG. The Section therefore is sensitive to the need to avoid this problem.

### CHANNEL OFFSETS AND BANDWIDTHS

10. The NPRM states that the Section's Petition for Reconsideration in GEN Docket 89-626,<sup>10</sup> will be held in abeyance pending resolution of providing the new frequencies discussed herein. It invites comments on potential narrowband technologies for low-cost, spectrum-efficient cordless telephones, and comments as to whether 20 kHz is the appropriate channel bandwidth.<sup>11</sup>

11. The Section continues to believe that for the FM format currently used by cordless telephones operating at 46/49 MHz, 20 kHz is the appropriate bandwidth. State-of-the-art digital techniques, such as those used in the emerging digital cellular radio standards, can transmit a speech signal over a 10 kHz channel, but at the expense of a complex speech coder (e.g., the VSELP vocoder used in the North American TDMA standard IS-54) and sophisticated digital radio modem techniques. As suggested in the NPRM, such designs are at odds with the low cost requirements of the consumer cordless telephone market. We do not believe that it will be cost-effective in the foreseeable future to implement a 10 kHz digital channel for cordless telephones.<sup>12</sup> Therefore, the Section encourages the Commission to grant its Petition for Reconsideration in GEN Docket 89-626 concurrently with taking action on the instant proceeding, and to adopt the Rules as proposed in the Appendix to the NPRM, which designates specific center frequencies with 20 kHz channel bandwidths.

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10. GEN Docket 89-626 concerned offset frequency operation for cordless telephones.

11. NPRM at par. 20.

12. It is noteworthy that digital cordless telephone technologies on the market today use substantially more bandwidth than the analog 46/49 MHz cordless telephones, which use a total bidirectional bandwidth of 40 kHz. For example, the ETSI standard CT-2 uses 100 kHz per channel, while DECT uses roughly 1.7 MHz for 12 user channels, or about 140 kHz per user channel. These standards have made the cost-versus-channel bandwidth tradeoff in favor of low cost.


**CONCLUSION**


12. The Section is fully supportive of the Commission's proposal as conveyed in the NPRM, and urges the Commission to proceed expeditiously to a Report and Order.


Respectfully submitted,

**TELECOMMUNICATIONS INDUSTRY  
ASSOCIATION**

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